

PATENT

Atty. Dkt. No. APPM/007034.P1/DSMLOW K/JW

REMARKS

This is intended as a full and complete response to the Final Office Action dated August 26, 2005, having a shortened statutory period for response set to expire on November 26, 2005. Please reconsider the claims pending in the application for reasons discussed below.

Claims 1-20 remain pending in the application and are shown above. Claims 1-20 stand rejected by the Examiner. Reconsideration of the rejected claims is requested for reasons presented below.

The Examiner asserts that in the claims, the language "comprising one ring and one or two carbon-carbon double bonds in the ring" will read on (1+) C=C being present, *i.e.*, 1, 2, 3 or more C=C, as well as 1 or more rings due to the open comprising language. The Examiner concludes that the claim language as written is inclusive of hydrocarbons with an aromatic ring(s). The Examiner also asserts that the phrase "mixture comprising..." means that if there are multiple Si precursors only one need to be both linear and oxygen-free, but other precursors can have any of the excluded features.

Applicants agree with the Examiner that the phrase "mixture comprising one or more linear, oxygen-free organosilicon compounds..." means that if there are multiple Si precursors, only one need be both linear and oxygen-free, but other precursors can have any of the excluded features.

Applicants respectfully traverse the Examiner's assertion that "comprising one ring and one or two carbon-carbon double bonds in the ring" reads on compounds having more than 1 ring and compounds having more than two carbon-carbon double bonds in the ring. Applicants submit that while "comprising" is open-ended language that does not exclude compounds that are not named in the claim, "comprising" language does not allow one to ignore the recited limitations for the named compounds in the claim, *i.e.*, in this case, one ring and one or two carbon-carbon double bonds in the ring for one or more oxygen-free hydrocarbon compounds. Applicants respectfully submit that the Examiner is erroneously reading "comprising one ring and one or two carbon-carbon double bonds in the ring" as "comprising a ring and a carbon-carbon

Page 6

402481_1.DOC

PATENT

Atty. Dkt. No. APPM/007034.P1/DSM/LOW K/JW

double bond", which would not be limited to only one ring and only one carbon-carbon double bond." Applicants use "one or more" instead of "a" to specify one or more oxygen-free hydrocarbon compounds having only one ring and only one or only two C=C bonds per ring. Applicants use the term "comprising" to avoid exclusion of other hydrocarbon compounds.

Claims 1-8 and 17-18 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-3, 17, 18, and 20 of co-pending U.S. Patent Application Serial No. 10/302,375. Applicants maintain their traversal of the provisional double patenting rejection as presented in the previously filed Response to Office Action dated April 14, 2005. However, in order to expedite prosecution and reduce the issues for appeal, Applicants are submitting a terminal disclaimer. Applicants respectfully request withdrawal of the provisional rejection of claims 1-8 and 17-18.

Claims 1-6 and 8 stand rejected under 35 U.S.C. § 102(e) as being anticipated by *Grill, et al.* (U.S. Patent No. 6,312,793). Applicants respectfully traverse the rejection. Applicants submit that *Grill, et al.*'s multicyclic hydrocarbons are hydrocarbon compounds comprising at least two rings and thus do not provide or suggest a hydrocarbon compound comprising one ring. Applicants further submit that *Grill, et al.*'s aromatic compounds do not provide or suggest hydrocarbon compounds comprising one or two carbon-carbon double bonds in a ring since aromatic rings have no carbon-carbon double bonds. As *Grill, et al.* does not teach or suggest a mixture comprising one or more oxygen-free hydrocarbon compounds comprising one ring and one or two carbon-carbon double bonds in the ring, *Grill, et al.* does not teach, show, or suggest a method for depositing a dielectric film, comprising delivering a gas mixture comprising one or more linear, oxygen-free organosilicon compounds, one or more oxygen-free hydrocarbon compounds comprising one ring and one or two carbon-carbon double bonds in the ring, and one or more oxidizing gases comprising oxygen (O₂) to a substrate surface at deposition conditions sufficient to deposit a dielectric film comprising Si, O, and C on the substrate surface, as recited in claim 1. Applicants respectfully request withdrawal of the rejection of claim 1 and of claims 2-6 and 8, which depend thereon.

Page 7

402481_1.DOC

PATENT

Atty. Dkt. No. APPM007034.P1/DSM/LOW K/JW

Claims 9-15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Grill, et al.* in view of *Wakizaka, et al.* (U.S. Patent No. 6,270,900). Applicants respectfully traverse the rejection. As discussed above, *Grill, et al.* does not teach or suggest a mixture comprising one or more oxygen-free hydrocarbon compounds comprising one ring and one or two carbon-carbon double bonds in the ring. *Wakizaka, et al.* provides cycloalkenes such as 1,3-cyclohexadiene as monomers for forming polymers for films for use with wiring boards, such as wiring films for semiconductor packages. The polymers of *Wakizaka* are derived from ring-opening or addition polymerization of a monomer having a ring structure. *Grill, et al.* describes porous, multiphase low dielectric constant films comprising a first phase of SiCOH and a second phase of C and H dispersed in a host matrix of the first phase. *Grill, et al.* does not teach or suggest that the films described therein are formed from polymers that are derived from ring-opening or addition polymerization of a monomer having a ring structure. Applicants respectfully submit that there is no motivation or suggestion in *Wakizaka, et al.* or *Grill, et al.*, individually or in combination, to use the hydrocarbon compounds that *Wakizaka, et al.* provides for polymer-based films to form the substantially different, multiphase film of *Grill, et al.*

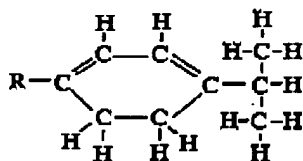
Thus, *Grill, et al.* in view of *Wakizaka, et al.* does not teach, show, or suggest a method for depositing a dielectric film, comprising delivering a gas mixture comprising one or more linear, oxygen-free organosilicon compounds, one or more oxygen-free hydrocarbon compounds comprising one ring and one or two carbon-carbon double bonds in the ring, and one or more oxidizing gases comprising oxygen (O₂) to a substrate surface at deposition conditions sufficient to deposit a dielectric film comprising Si, O, and C on the substrate surface, wherein the one or more linear, oxygen-free organosilicon compounds comprises trimethylsilane and the one or more oxygen-free hydrocarbon compounds comprises alpha-terpinene, as recited in claim 9. Applicants respectfully request withdrawal of the rejection of claim 9 and of claim 10, which depends thereon.

Grill, et al. in view of *Wakizaka, et al.* does not teach, show, or suggest a method for depositing a dielectric film, comprising delivering a gas mixture comprising one or

PATENT

Atty. Dkt. No. APPM/007034.P1/DSM/LOW K/JW

more linear, oxygen-free organosilicon compounds, one or more oxygen-free hydrocarbon compounds including the structure



wherein R is selected from the group consisting of linear alkane groups having one to five carbons, and one or more oxidizing gases comprising oxygen (O₂) to a substrate surface at deposition conditions sufficient to deposit a dielectric film comprising Si, O, and C on the substrate surface, as recited in claim 11. Applicants respectfully request withdrawal of the rejection of claim 11 and of claims 12-15, which depend thereon.

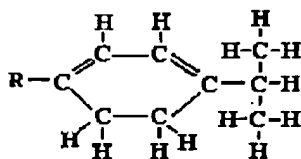
Claims 17-18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Grill, et al.* in view of *Goo, et al.* (U.S. Patent No. 6,057,251) or *Ross* (U.S. Patent No. 6,271,146). Claims 16 and 19-20 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Grill, et al.*, in view of *Wakizaka, et al.* and further in view of *Goo, et al.* or *Ross*. The Examiner asserts that it would have been obvious to employ the electron beam post-treatment of *Goo, et al.* or *Ross* instead of a thermal post-treatment in the process of *Grill, et al.* to obtain the advantages that electron beam post-treatment has been shown to provide analogous films. Applicants respectfully maintain their traversal of the rejections of claims 16-20 as stated in the previously filed Response to Office Action dated April 14, 2005. In summary, Applicants submit that there is no suggestion, motivation, or reasonable expectation of success in *Grill, et al.*, *Wakizaka, et al.*, *Goo, et al.*, or *Ross*, individually or in combination, to replace the thermal post-treatment of *Grill, et al.* that reduces film density with the electron beam treatment that *Goo, et al.* and *Ross* provide to increase film density.

Applicants further submit that neither *Grill, et al.* in view of *Goo, et al.* or *Ross* nor *Grill, et al.* in view of *Wakizaka, et al.* and *Goo, et al.* or *Ross* teaches or suggests all of the limitations of claims 16-20, as the cited references, individually or in combination, do not teach or suggest using a gas mixture comprising one or more linear, oxygen-free organosilicon compounds and one or more oxygen-free hydrocarbon compounds

PATENT

Atty. Dkt. No. APPM/007034.P1/DSM/LOW K/JW

comprising one ring and one or two carbon-carbon double bonds in the ring, (such as a compound including the structure



to deposit a dielectric film comprising Si, O, and C. As discussed above, *Grill, et al.* in view of *Wakizaka, et al.* does not teach or suggest using a gas mixture comprising one or more linear, oxygen-free organosilicon compounds and one or more oxygen-free hydrocarbon compounds comprising one ring and one or two carbon-carbon double bonds in the ring to deposit a dielectric film. Applicants further submit that *Goo, et al.* or *Ross*, individually or in combination with each other and *Grill, et al.* and *Goo, et al.*, does not teach or suggest using a gas mixture comprising one or more linear, oxygen-free organosilicon compounds and one or more oxygen-free hydrocarbon compounds comprising one ring and one or two carbon-carbon double bonds in the ring to deposit a dielectric film. Applicants respectfully request withdrawal of the rejection of claims 16-20.

Claims 1-6 & 8 stand rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-2, 5, 6, 8, 10-12, 14, 20, and 22-23 of U.S. Patent No. 6,797,643. Applicants maintain their traversal of the provisional double patenting rejection as presented in the previously filed Response to Office Action dated April 14, 2005. However, in order to expedite prosecution and reduce the issues for appeal, Applicants are submitting a terminal disclaimer. Applicants respectfully request withdrawal of the rejection of claims 1-6 and 8.

In conclusion, the references cited by the Examiner, alone or in combination, do not teach, show, or suggest the invention as claimed.

The secondary references made of record are noted. However, it is believed that the secondary references are no more pertinent to the Applicants' disclosure than the primary references cited in the Final Office Action. Therefore, Applicants believe that a

Page 10

402481_1.DOC

PATENT

Atty. Dkt. No. APPM/007034.P1/DSMLOW K/JW

detailed discussion of the secondary references is not necessary for a full and complete response to this Final Office Action.

Having addressed all issues set out in the Final Office Action, Applicants respectfully submit that the claims are in condition for allowance and respectfully request that the claims be allowed.

Respectfully submitted,



Keith M. Tackett
Registration No. 32,008
PATTERSON & SHERIDAN, L.L.P.
3040 Post Oak Blvd. Suite 1500
Houston, TX 77056
Telephone: (713) 623-4844
Facsimile: (713) 623-4846
Attorney for Applicant(s)